REMARKS

Claims 1-3, 5, 6 and 9-23 remain pending in this application.

Claims 1-3, 5, 6 and 9-23 have been rejected under 35 U.S.C. § 103 as being unpatentable over Ishimura et al. (EP 0304503) in view of Kihara et al. (U.S. Patent No. 5,936,011). Pointing to the Abstract, Ishimura et al. is said to teach a curing agent/hardener comprising a core/powder of an amine compound that has at least one tertiary amino group, a reaction product of the amine compound and an epoxy resin as a capsule membrane/shell on the surface of the core/powder. The Office acknowledges that Ishimura et al. does not teach that the epoxy resin (D) used to react with the amine curing agent (A) used in the shell has a total amount of chlorine of not more than 400 ppm as recited in claim 1. Kihara et al. is relied on as teaching an epoxy curing agent (col. 1, lines 5-10) comprising the reaction product of an amine and epoxy (example 1) with a total chlorine content in the epoxy of 390 ppm (production example 1). The Office concludes that it would be obvious to use an epoxy with a total chlorine content taught by Kihara et al. with the curing agent of Ishimura et al. to obtain such desirable properties as better water resistance as evidenced by Kihara et al. (col. 2, lines 1-5 and results in Table 1). Applicants respectfully disagree.

The curing agent made from the reaction of a polyamine and epoxy in col. 2, lines 18-32 of Kihara et al. fails to teach or suggest the recited total chlorine content of the epoxy curing agent used in the shell of the recited capsule. This is because, although the total chlorine content disclosed in Kihara et al. may be the total chlorine content contained in "the amine curing agent (A)" constituting the core required in the instant claim, the total chlorine content disclosed in Kihara et al. is never the total

chlorine content contained in "the epoxy resin (D)" constituting the shell required in the instant claim.

The attached figure 1 shows the reactions specified by "a modified polyamine having a low chlorine content can be obtained by reacting in the presence of an alkali a polyamine with a halohydrin [specifically, chlorohydrin] being obtained by the reaction between a polyoxyalkylene polyether and an epichlorohydrin in the presence of an acidic catalyst" as described in col. 2, lines 19-24 of Kihara et al. Attached figure 2 shows the reactions specified by "an aqueous epoxy resin curing agent being obtained by adduct reacting the above-mentioned modified polyamine thus obtained with a hydrophobic epoxy compound" described in col. 2, lines 24-27 of Kihara et al. Also, in these figures, the mixture surrounded by border (I) corresponds to the modified polyamine disclosed in Kihara et al., and the material in border (II) corresponds to the chlorohydrin which does not react with the polyamine and remains as an unreacted material.

As shown in figure 1, a chlorohydrin is obtained by the reaction between a polyoxyalkylene polyether and an epichlorohydrin in the presence of an acidic catalyst. Some of the chlorohydrins obtained thereby react with the polyamine, but the others remain as an unreacted material. As a result, as shown in border (I) in figure 1, the modified polyamine containing the chlorohydrin as an unreacted material is formed. Therefore, the total chlorine content of the modified polyamine corresponds to the total chlorine content of the chlorohydrin contained therein as the unreacted material. Thus, the chlorine content (i.e., 390 ppm) disclosed in Preparation Example 1 of Kihara et al.

shows the total chlorine content of the chlorohydrin contained in the modified polyamine as an unreacted material.

Furthermore, as shown in figure 2, the aqueous epoxy resin curing agent is obtained by the reaction between the modified polyamine containing the chlorohydrin as an unreacted material, formed in figure 1, and the hydrophobic epoxy compound. However, since a chlorohydrin does not have a reaction point, the chlorohydrin does not react with the hydrophobic epoxy compound. Therefore, the chlorohydrin (which corresponds to material in border (II) in figures 1 and 2) contained in the modified polyamine remains in the aqueous epoxy resin curing agent as it is. As a result, the total chlorine content of the aqueous epoxy resin curing agent corresponds to the total chlorine content of the chlorohydrin contained in the aqueous epoxy resin curing agent, i.e., the total chlorine content of the chlorohydrin derived from the chlorohydrin contained in the modified polyamine as an unreacted material.

Accordingly, taking Example 1 disclosed in Kihara et al. for example, the total chlorine content (i.e., 60 ppm) of the aqueous epoxy resin curing agent in Table 1 shows the total chlorine content of the chlorohydrin contained in the aqueous epoxy resin curing agent, i.e., the total chlorine content of the chlorohydrin derived from the chlorohydrin contained in the modified polyamine as an unreacted material.

Also, as shown in figures 1 and 2, chlorine contained in the chlorohydrin disclosed in Kihara et al. is derived from the epichlorohydrin of the raw material, and not derived from the hydrophobic epoxy compound. Thus, it is apparent that although the total chlorine content disclosed in each of preparation example 1, and Table 1 of Kihara et al. may teach or suggest the total chlorine content of the chlorohydrin contained in

the modified polyamine as an unreacted material, this fails to teach or suggest the total chlorine content contained in the hydrophobic epoxy compound as recited in these claims.

On the other hand, as seen in claim 1 in the above-identified application, the capsule curing agent claimed requires containing the specific core and the specific capsule membrane covering this core; the specific core is composed of the amine curing agent (A); and the specific capsule membrane is composed of the specific shell and the specific intermediate layer. The above shell is required to be the reaction product between the amine curing agent (A) and the epoxy resin (D), because of being formed by the reaction of the amine curing agent (A) and the epoxy resin (D). Additionally, the total amount of chlorines contained in the epoxy resin (D) constituting the above shell is required to be not more than 400 ppm.

The amine curing agent (A) in attached figure 3 substantially corresponds to the modified polyamine disclosed in Kihara et al., i.e., the mixture surrounded by border (I) in figures 1 and 2. As described above, a chlorohydrin does not react with a hydrophobic epoxy compound, because the chlorohydrin does not have a reaction point. And thus even though a chlorohydrin disclosed in Kihara et al. is contained in the amine curing agent (A), the chlorohydrin does not contribute to the formation of the above shell required in the instant claim. This only contributes to the formation of the core required in the instant claim.

As seen in claim 1, for example, the instant invention does not require the limitation of the total chlorine content contained in "the amine curing agent (A)"

constituting the core but the limitation of the total chlorine content contained in "the epoxy resin (D)" constituting the shell. Accordingly, for those reasons, it is apparent that Kihara et al. fails to teach or suggest the total amount of chlorines contained in the epoxy resin (D) constituting the shell required in the instant claim.

Limiting the amount of chlorines in the epoxy resin is important. When the terminal of the epoxy resin (D) has chlorine, the crosslinking reaction between the amine curing agent (A) and the epoxy resin (D) is interrupted. As a result, defects at the crosslinking points occur, thereby forming a shell with a coarse network density that leads to poor storage stability. In order to avoid such a situation while retaining the crosslinking reaction, the total amount of chlorines contained in the epoxy resin (D) constituting the shell needs to be not more than 400 ppm. In such a case, defects at the crosslinking points can be avoided thereby forming a compact shell providing good storage stability and hardening property.

Since neither Ishimura et al. nor Kihara et al., alone or in combination, teach or suggest all the features of any one of the pending claims, this rejection should be withdrawn and a notice of allowance promptly issued.

Prompt and favorable reconsideration of this application is respectfully regarded.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

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By: Charles E Van Horn
Charles E. Van Horn
Reg. No. 40,266
(202) 408-4000

Attachments: Figures 1-3